US Army Corps of Engineers ®
Rock Island District

Lock & Dam 21
(Quincy, Illinois)
Mississippi River

General Contractors:
Lock: Joseph Meltzer, Inc., New York, New York
Dam: McCarthy Improvement Company, Davenport, Iowa
Construction: 1933-1939
Congressional Districts: MO-9; IL-17

Description

Lock and Dam 21 is 324.9 miles above the confluence of the Mississippi and Ohio Rivers. The complex stretches across the river at a point where the valley is wide with flat bottom land on either side of the river. The city of Quincy, Illinois, lies on the low bluffs along the river just upstream from the complex.

The movable dam has 10 submersible, elliptical Tainter gates (20-feet high and 64-feet long) and three submersible roller gates (20-feet high and 100-feet long). The dam system also includes two earth and sand-filled transitional dikes, and a submersible earth dike.

Lock dimensions are 110-feet wide by 600-feet long with additional provisions for an auxiliary lock. Normal upper pool elevation is 470.0, approximately 16 feet above the tail waters of the dam at low water. When both pools are at their normal depths, the difference in elevation is reduced to 11 feet or less.

The maximum lift is 10.5 feet with an average lift of 6.55 feet. It takes approximately 7 minutes to fill or empty the lock chamber. It takes 5 hours for water to travel from Lock and Dam 20, in Canton, Missouri, to Lock and Dam 21.

History/Significance

Because Lock and Dam 21 was located adjacent to Quincy, which had acute unemployment, the complex was built before some of the other, higher priority locks and dams. The lock, central control station, and esplanade were completed by August 1935. At that point, however, no money was available to begin the dam. As a result, representatives from Quincy vigorously, and successfully, lobbied for federal money to construct the dam as a work relief project. The dam was completed in 1939. The lock and dam elements of the complex were completed at a cost of $4,155,000.

Annual Tonnage (10-Year Historical)

Year	Tons	Year	Tons
1998	33,312,353	2003	32,025,867
1999	37,863,139	2004	26,556,326
2000	36,449,116	2005	27,127,688
2001	32,874,457	2006	29,497,577
2002	37,208,243	2007	28,546,672

(More Information On The Reverse Side)

Commodity Tonnage & Lockages (2007)

Coal	3,974,706	Subtotals:	
Petroleum	469,682		
Chemicals	3,227,448	Grain	15,596,918
Crude Materials	2,034,027	Steel	316,968
Manufactured Goods	765,758		
Farm Products	18,043,347	Lockages:	
Manufactured Machinery	25,280		
Waste Material	1,800	Boats:	3,273
Containers & Pallets	1,624	Cuts:	4,670
Unknown	3,000		

Current Maintenance Issues – Lock & Dam 21

Item (Critical Rank Order)

- Systemic Miter Gate Replacement - Includes Miter Gate Rehabilitation Report
- Systemic Bulkhead Slots
- Dam Gate Rehabilitation – Exterior
- Lock Strut Arm Replacements & Traveling Kevel Rail Mule Replacements
- Repair Roller End Shields & Seals
- Structural Repairs - Roller & Tainter Gates – Interior
- Systemic - Crane Rail Adjustments
- Upper Approach Erosion Repairs
- Dam Piers Concrete Repairs
- Resurface Horizontal Concrete Intermediate Wall & Riverwall
- Miter Gate Machinery/Gearbox Repair
- Systemic Tainter Valve Replacement
- Rehabilitation Evaluation Report
- Concrete & Armor Repairs
- Replacing 70-Year-Old Lock Pontoon Barges (Work Flats)
- Bridge Crane Repairs to Lattice Boom & Crane Undercarriage
- Systemic - Standby Generator & Compressor Enclosures
- Pave Lower Turnaround & Ranger Station Entrance
- New Maintenance Building

TOTAL ESTIMATED COST: $35,700,000

The Water Resources Development Act of 2007 (WRDA 07) Title VIII authorized the dual-purpose navigation and ecosystem restoration plan for the Upper Mississippi River and Illinois Waterway. The new 1,200-foot lock, which will be located in the auxiliary lock chamber, will cost approximately $322,000,000. The design and construction of the new lock is dependent upon annual appropriations.

The existing 9-foot Channel Navigation Project was largely constructed in the 1930's and extends down the Upper Mississippi River from Minneapolis-St. Paul to its confluence with the Ohio River and up the Illinois Waterway to the Thomas J. O'Brien Lock in Chicago. It includes 37 Locks and approximately 1,200 miles of navigable waterway in Illinois, Iowa, Minnesota, Missouri, and Wisconsin. The system's 600-foot locks do not accommodate today's modern tows without splitting and passing through the lock in two operations. This procedure requires uncoupling barges at midpoint which triples lockage times and exposes deckhands to increased accident rates.

More than 580 manufacturing facilities, terminals, and docks ship and receive tonnage in the Upper Mississippi River basin. In 2005, the system moved more than 160 million tons of commercial cargo worth roughly $28.5 billion. Grains (corn and soybeans) dominate traffic on the system. Other commodities, mainly cement and concrete products, comprise the second largest group. A modern 15-barge tow transports the equivalent of 870 large semi-trucks (22,500 cargo tons, 787,500 bushels, or 6,804,000 gallons). Annually, the project generates an estimated $1 billion of transportation cost savings compared with the operation and maintenance costs of approximately $115 million.

In constant dollar terms, operations and maintenance funding for the system has been largely flat or declining for decades, while maintenance needs of the aging infrastructure increase. This is adversely affecting reliability of the system. Long-established programs for preventative maintenance of major lock components have essentially given way to a fix-as-fail strategy, with repairs sometimes requiring weeks or months to complete. Depending on the nature of a lock malfunction, extended repairs can have major consequences for shippers, manufacturers, consumers, and commodities investors.

Point of Contact

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